

cationic conditions, or combinations thereof, wherein said paper or paperboard is made by the method of claim 1.

### REMARKS

Reconsideration and continued examination of the above-identified application are respectfully requested.

The amendment to the claims further defines what applicants regard as their invention. The applicants are simply incorporating the language of dependent claim 9 into independent claims 1 and 17 and amending 13 to properly depend it on claim 1, since claim 9 is cancelled. Therefore, no new questions of patentability should arise nor does the amendment necessitate any further searching on the part of the Examiner since the Examiner has essentially considered similar subject matter in original claim 9. The amendment places the application in condition for allowance. At a minimum, the amendment places the application in a better condition for appeal. Accordingly, no questions of new matter should arise and entry of the amendment is respectfully requested.

At page two of the Office Action, the Examiner rejects claims 1, 4-13, and 16-22 under 35 U.S.C. §103(a) as being unpatentable over Smith, Jr. (U.S. Patent No. 5,221,435) taken in view of Braitberg (U.S. Patent No. 3,234,075) or Bugosh (U.S. Patent No. 2,917,426). The Examiner indicates that the rejection set forth in the Office Action dated December 19, 2001 (Paper No. 7) is repeated, and further indicates that the remarks of the applicants have been fully considered, but were not found to be persuasive. For the following reasons, this rejection is respectfully traversed.

Smith, Jr. ("Smith") relates to a paper product formed from a mineral filler containing cellulosic slurry. The abstract of Smith specifically states that retention performance is provided by the sequential addition of cationic charge-biasing species and anionic flocculant, and then by

the addition of a certain microparticle. This process requires the shear stage to be interposed between the flocculation addition and the microparticle, which is an inorganic cationic source of aluminum. The cationic charge-biasing species in Smith are cationic polymers, such as cationic nitrogen polymers and acrylamide. There is no teaching or suggestion in Smith of using fibrous cationic colloidal alumina microparticles or the use of nonionic polymers. Most importantly, Smith requires first adding a cationic charge-biasing species and an anionic flocculant and then adding certain microparticles. Thus, Smith clearly teaches away from the claimed invention which recites the addition of cationic colloidal alumina microparticles prior to introducing the polymer to the pulp.

With respect to Braitberg, this patent relates to a method and composition for the control of slimes generally and pitch particularly, in the recirculating water of pulp and paper mills. The agent used in Braitberg for controlling slimes in an aqueous media is a cationic colloidal alumina in fibrous form. Controlling pitch and the retention of paper-pulp fines are two different techniques, and not easily combinable. It is unlikely one skilled in the art would combine Braitberg with Smith for this reason. In column 2 of Braitberg, the patent does mention that the use of alum in paper mill waters tends to precipitate the pitch in sticky agglomerated form that constitutes a more troublesome slime than the original pitch itself. This is not the same as paper making as shown in Smith. Braitberg adds a cationic colloidal fibrous alumina in macromolecular form to the aqueous media. Also, there is no teaching or suggestion in Braitberg of using cationic or nonionic polymers in combination with fibrous cationic colloidal alumina microparticles to form a stable microparticle sol retention aid for use in a papermaking process.

Also, Braitberg does mention that the fibrous colloidal alumina monohydrates are added

prior to the pulp in order to form a floc, which then attaches onto the pulp. Since the main purpose of Braitberg is to flocculate the pitch and other impurities in the pulp water as a result of slime, one skilled in the art would not be motivated to add any other ingredients that may interfere with this control of slime prior to being mixed with pulp. Accordingly, one skilled in the art would not look to Braitberg for any solutions or substitutions in view of Smith. In other words, one skilled in the art would not use any of the cationic fibrous material in Smith because Smith does not teach or suggest the use of any fibrous material. Furthermore, Braitberg relates to controlling slime prior to being mixed with pulp and Smith specifically relates to using polymers with certain types of microparticles in making paper. The two patents are not related and in fact relate to solving different problems. Moreover, Smith teaches away from the claimed invention by requiring the sequential addition of a cationic charge-biasing species, an anionic flocculant and then certain microparticles. Accordingly, even the combination of Smith and Braitberg do not teach or suggest the claimed invention.

With respect to Bugosh, this patent relates to felted products and to processes for preparing the same. Bugosh uses fibrous alumina monohydrates to make a useful binder for felted products having a variety of useful and superior properties. There is no teaching or suggestion in Bugosh of using cationic or nonionic polymers. Thus, one skilled in the art would not be motivated to combine Smith with Braitberg or Bugosh to make the claimed invention that uses a specific combination of polymer with microparticle. Moreover, Smith teaches away from the claimed invention by requiring the sequential addition of a cationic charge-biasing species, an anionic flocculant and then certain microparticles. Accordingly, even the combination of Smith and Bugosh does not teach or suggest the claimed invention.

With respect to claims 17-22, Smith, Braitberg, or Bugosh do not teach or suggest the apparatus used in the paper making process of the claimed invention. In particular, contrary to the Examiner's position, claim 17 specifically recites a supply of fibrous cationic colloidal alumina microparticles, a supply of retention system polymer, and a device for feeding each component to pulp or treated pulp, wherein the supply of cationic colloidal alumina microparticles is located upstream from the supply of the retention system polymers. Certainly, Smith, which shows the completely opposite process, would have a supply of microparticles upstream of the supply of polymers. It wouldn't make sense, when Smith adds the polymer first. Clearly, the cited references do not teach such an apparatus as claimed in the present application. As such, for the reasons set forth above, claim 17 is patentable. Claims 4-13, 16, and 18-22 are dependent directly or indirectly on claims 1 or 17. Therefore, the reasons set forth above with respect to patentability of claims 1 and 17 would also apply here. Accordingly, the rejection under 35 U.S.C. §103(a) over Smith in view of Braitberg or Bugosh should be withdrawn.

At page 2 of the Office Action, the Examiner rejects claim 2, 3, and 23 under 35 U.S.C. §103(a) as being unpatentable over Smith taking in view of Braitberg or Bugosh and further in view of Sippel (WO 97/41063). The Examiner indicates that the rejection set forth in the Office Action dated December 19, 2001 (Paper No. 7) is repeated, and further indicates that the remarks of the applicants have been fully considered, but were not found to be persuasive. For the following reasons, the rejection is respectfully traversed.

The comments above with respect to Smith, Braitberg, and Bugosh apply equally here. With respect to Sippel, this application relates to a salt of boehmite alumina suitable for use in dyeing and purifying a waste stream or effluent. According to Sippel, placing a cationic fibrous

acetate salt of boehmite alumina in contact with a dye waste stream leads to flocculation or precipitation of the dyes without contamination of the stream with other ionic species. Sippel relates strictly to the use of cationic fibrous acetate salt in dyeing fabrics. Furthermore, as part of this dyeing, Sippel uses a salt of boehmite alumina in purifying a waste stream or effluent. Sippel has nothing to do with using the particular cationic fibrous acetate salt in papermaking nor does Sippel teach or suggest the advantages achieved with using a cationic fibrous acetate salt with the various cationic or nonionic polymers as set forth in the claims of the present application. Sippel is non-analogous art because it does not relate to the particular technology area of the claimed invention. Thus, one would not even look to Sippel for any solutions with respect to the deficiencies of Smith, Bugosh, or Braitberg. Furthermore, claims 2, 3, and 23 are dependent directly on claims 1 and 22. Therefore, the reasons set forth above with respect to patentability of those claims would also apply here. Additionally, as stated earlier, Smith teaches away from the claimed invention by requiring the sequential addition of a cationic charge-biasing species, an anionic flocculant, and then certain microparticles. Accordingly, even the combination of Smith, Braitberg, Bugosh, and Sippel does not teach or suggest the claimed invention nor shows the advantages and benefits achieved by the claimed invention. As such, for the reasons set forth above, claims 2, 3, and 23 are patentable. Accordingly, the rejection under 35 U.S.C. §103(a) over Smith in view of Sippel, Braitberg, or Bugosh should be withdrawn.

At page 2 of the Office Action, the Examiner rejects claims 14 and 15 under 35 U.S.C. §103(a) as being unpatentable over Smith, in view of Braitberg or Bugosh and further in view of Sarkar et al. (U.S. Patent No. 5,169,497) or Sarkar et al. (U.S. Patent No. 5,507,914). The Examiner indicates that the rejection set forth in the Office Action dated December 19, 2001 (Paper

No. 7) is repeated, and further indicates that the remarks of the applicants have been fully considered, but were not found to be persuasive. For the following reasons, this rejection is respectfully traversed.

The comments above with respect to Smith, Braitberg, and Bugosh apply equally here. With respect to Sarkar et al. '497, this patent relates to the process for improving freeness of paper pulp by adding to the pulp a cellulolytic enzyme, allowing the pulp to contact the cellulolytic enzyme for at least twenty minutes, and adding a water-soluble cationic polymer to form the treated pulp into paper. There is no teaching or suggestion in Sarkar et al. '497 of using the fibrous cationic colloidal alumina microparticles as recited in claim 1.

With respect to Sarkar et al. '914, this patent is very similar to Sarkar et al. '497 in that the purpose of the invention is to enhance the freeness of paper pulp by adding a cellulolytic enzyme in a vertical tank to the paper-making process, allowing the pulp to contact cellulolytic enzyme, adding a water-soluble cationic polymer, and forming the pulp into paper. Furthermore, Sarkar et al. '914 makes use of a water-soluble anionic polymer after the addition of the water-soluble cationic polymer. Since claims 14 and 15 are dependent directly on claim 1, the reasons set forth above with respect to patentability of claim 1 would also apply here. Therefore, the combination of Smith, Braitberg, Bugosh, and Sarkar et al. '497 and/or '419 would not teach or suggest the claimed invention nor show the advantages and benefits achieved by the claimed invention. Accordingly, the rejection under 35 U.S.C. §103(a) over Smith in view of Sarkar et al. '497 or '419, and in view of Braitberg, or Bugosh should be withdrawn.

Amendment After Final  
U.S. Patent Application No. 09/803,225

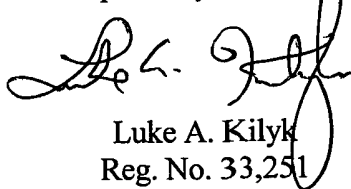
The applicants believe that all the pending claims are patentable over the cited references; however, the Examiner is invited to contact the undersigned by telephone, if there are any remaining questions as to the patentability of the present claims.

**CONCLUSION**

In view of the foregoing remarks, Applicants respectfully request the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 50-0925. If a fee is required for an extension of time under 37 C.F.R. §1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

1. A method of making paper or paperboard comprising:

introducing fibrous cationic colloidal alumina microparticles to a papermaking pulp and introducing at least one polymer to said papermaking pulp, to form a treated pulp, said polymer comprising a cationic polymer, a nonionic polymer, or an amphoteric polymer under cationic conditions or combinations thereof; and

forming the treated pulp into paper or paperboard, wherein said fibrous cationic colloidal alumina microparticles are added to said papermaking pulp prior to introducing said polymer to said pulp.

13. (Amended) The method of claim [9] 1, wherein said polymer is a synthetic, water-soluble cationic polymer containing acrylamide units and cationic monomeric units.

17. (Amended) A papermaking apparatus comprising a supply of fibrous cationic colloidal alumina microparticles, a supply of a papermaking pulp, a device for feeding fibrous cationic colloidal alumina microparticles from the supply of fibrous cationic colloidal alumina microparticles to the supply of papermaking pulp, a supply of a retention system polymer, a device for feeding retention system polymer from the supply of retention system polymer to the pulp or treated pulp, wherein the supply of fibrous cationic colloidal alumina microparticles is located upstream from the supply of the retention system polymers, and a device for forming the pulp into a paper or paperboard after treatment with said fibrous cationic colloidal alumina microparticles and said retention system polymer, wherein said retention system polymer is a cationic polymer, a nonionic polymer, or an amphoteric polymer under cationic conditions, or combinations thereof.



22. (Amended) A paper or paperboard made from a drained paperweb, said paperweb comprising a treated pulp, said treated pulp comprising cellulosic fibers, fibrous cationic colloidal alumina microparticles, and at least one retention system polymer, said retention system polymer comprising a cationic polymer, a nonionic polymer, or an amphoteric polymer under cationic conditions, or combinations thereof, wherein said paper or paperboard is made by the method of claim 1.